

Dial indicators are available in various ranges and graduations. They use three basic types of mounting bases: magnetic, clamp, or screw-in stud. When purchasing a dial indicator, select the magnetic stand type (B, **Figure 36**) with a continuous dial face (**Figure 37**).

### Cylinder Bore Gauge

A cylinder bore gauge is similar to a dial indicator. The gauge set shown in **Figure 38** consists of a dial indicator, handle, and different length adapters (anvils) to fit the gauge to various bore sizes. The bore gauge is used to measure bore size, taper and out-of-round. When using a bore gauge, follow the manufacturer's instructions.

### Compression Gauge

A compression gauge (**Figure 39**) measures combustion chamber (cylinder) pressure, usually in psi or kg/cm<sup>2</sup>. The gauge adapter is either inserted or screwed into the spark plug hole to obtain the reading. Disable the engine so it will not start and hold the throttle in the wide-open position when performing a compression test. An engine that does not have adequate compression cannot be properly tuned. See Chapter Three.

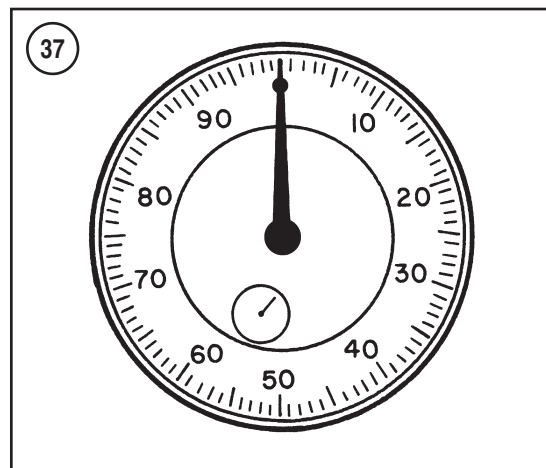
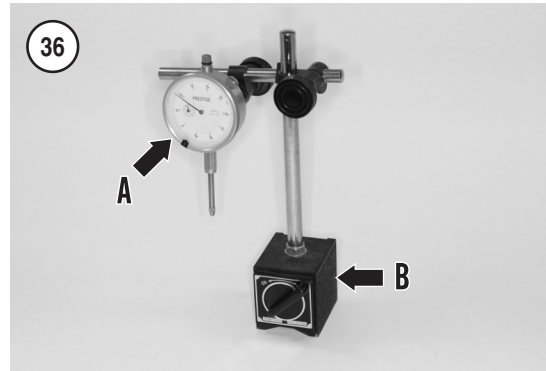
### Spark Tester

A quick way to check the ignition system is to connect a spark tester to the end of the spark plug wire and operate the engine's kickstarter. A visible spark should jump the gap on the tester. A variety of spark testers are available from aftermarket manufacturers. Use of this tool is described in Chapter Two.

### Multimeter

A multimeter (**Figure 40**) is an essential tool for electrical system diagnosis. The voltage function indicates the voltage applied or available to various electrical components. The ohmmeter function tests circuits for continuity and measures the resistance of a circuit.

Some test specifications for electrical components are based on results using a specific test meter. Results may vary if a meter not recommend by the



manufacturer is used. Such requirements are noted when applicable.

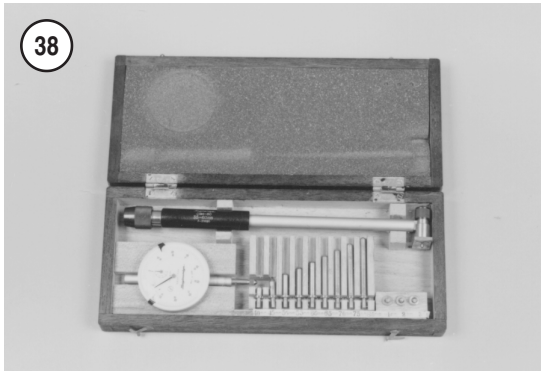
### Ohmmeter (analog) calibration

Each time an analog ohmmeter is used or if the scale is changed, the ohmmeter must be calibrated. Digital ohmmeters do not require calibration.

1. Make sure the meter battery is in good condition.
2. Make sure the meter probes are in good condition.
3. Touch the two probes together and watch the needle. It must align with the 0 mark on the scale.
4. If necessary, rotate the set-adjust knob until the needle points directly to the 0 mark.

## ELECTRICAL SYSTEM FUNDAMENTALS

A thorough study of the many types of electrical systems used in today's ATVs is beyond the scope



of this manual. However, an understanding of electrical basics is necessary to perform simple diagnostic tests.

### Electrical Component Replacement

Most motorcycle dealerships and parts suppliers will not accept the return of any electrical part. If you cannot determine the exact cause of any electrical system malfunction, have a Honda dealership retest that specific system to verify your test results.

If you purchase a new electrical component(s), install it, and then find that the system still does not work properly, you will probably be unable to return the unit for a refund.

Consider any test results carefully before replacing a component that tests only *slightly* out of specification, especially resistance. A number of variables can affect test results dramatically. These include: the testing meter's internal circuitry, ambient temperature and conditions under which the machine has been operated.

### Voltage

Voltage is the electrical potential or pressure in an electrical circuit and is expressed in volts. The more pressure (voltage) in a circuit, the more work that can be performed.

Direct current (DC) voltage means the electricity flows in one direction. All circuits powered by a battery are DC circuits.

Alternating current (AC) means that the electricity flows in one direction momentarily then switches to the opposite direction. Alternator output is an example of AC voltage. This voltage must be changed or rectified to direct current to operate in a battery powered system.

### Resistance

Resistance is the opposition to the flow of electricity within a circuit or component and is measured in ohms. Resistance causes a reduction in available current and voltage.

Resistance is measured in an inactive circuit with an ohmmeter. The ohmmeter sends a small amount of current into the circuit and measures how difficult it is to push the current through the circuit.

An ohmmeter, although useful, is not always a good indicator of a circuit's actual ability under operating conditions. This is due to the low voltage (6-9 volts) that the meter uses to test the circuit. The voltage in an ignition coil secondary winding can be several thousand volts. Such high voltage can cause the coil to malfunction, yet the fault may not be detected during a resistance test.

Resistance generally increases with temperature. Perform all testing with the component or circuit at room temperature. Resistance tests performed at high temperatures may indicate high resistance

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